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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, GHS & 1272/2008/EC Standards

SDS Revision: 3.0

|                                      |                        | 1.   | PRODUC  | T & COM  | PANY   | IDENT  | HEICA  | MIOI   | V   |  |   |  |  |
|--------------------------------------|------------------------|--|---|--|--|--|--|--|---|--|---|--|--|
| 1.1                                  | Product Name:          |  |   |  |  |  |  |  |   | 1701   | ΙΤΔΙ  | 1  |  |
| 1.2                                  | Chemical Name:         |  | EXECUTIVE NICKEL BASED FCAW WIRES (FLAT & HORIZONTAL)  Nickel Base Alloy  |  |  |  |  |  |   |  |   |  |  |
| 1.3                                  | Synonyms:              | FC FC  |   |  |  |  |  |  |   |  |   |  |  |
| 1.4                                  | Trade Names:           | Executive 190  | Executive 190 FC, Executive 82 FC, Executive 117 FC, Executive Weld-A FC, Executive 182 FC, Executive 622 FC, Executive 625 FC, Executive C-276 FC, Executive 55 MC, Executive 55 FC-O  |  |  |  |  |  |   |  |   |  |  |
| 1.5                                  | Product Use:           | Welding Wire   |   |  | ,  |  |  |  |   |  |   |  |  |
| 1.6                                  | Distributor's Name:    | Exocor Ltd.  |   | *  |  |  |  |  |   |  |   |  |  |
| 1.7                                  | Distributor's Address: |  | oad, St. Catharin   | es Ontario I 2S  | 0B3 Cana   | ada  |  |  |   |  |   |  |  |
| 1.8                                  | Emergency Phone:       | 1-888-317  |   | ioo, omano EEO   | obo, can   | uuu  |  | Harley III   |   |  |   |  |  |
| 1.9                                  | Business Phone / Fax:  |  | 17-2209, Fax: 1   | -855-317-2209  |  |  |  |  |   |  |   |  |  |
|                                      |                        | 4  |   |  |  |  |  |  |   |  |   |  |  |
|                                      |                        |  |   | AZARDS   |  |  |  |  |   |  |   |  |  |
| 2.1                                  | Hazard Idenlification: | classification DANGER! N REPEATED  | t is classified<br>criteria of NOH<br>MAY CAUSE O<br>EXPOSURE.<br>1: Carc. 1A; ST   | ISC: 1088 (199<br>CANCER. MA<br>CAUSES SER   | 9) and A[<br>Y CAUSE<br>OUS EYE  | OG Code (<br>DAMAG<br>IRRITAT  | Australia E TO OF  | ).<br>RGANS  | (LUN  | GS) TH   | IROU  | GH PR  | OLONGED O  |
| 2.2                                  | Label Elements:        | May cause repeated exp Precautionar handle until dust/fume. P after handling outdoors or protection/fac in a position water for sev P308+P313  | y Statements ( all safety prec 264 – Wash h g. P270 – Do in a well-vent comfortable for veral minutes. – IF exposed   | tation. H372 –  (P): P201 – Cautions have ands and exprosor eat, drink liated area. FP304+P340 – I or breathing. Remove contaor concerned  | Causes d Detain specific been real cosed skin or smoke 280 – W F INHALE 2305+P35 ct lenses, Get me   | amage to d and undereas with when us Vear prote ED: Remove 1+P338 - , if present   | organs ( lections bederstood the soap aling this ective glove victime. IF IN Ent and eace/attent   | efore us. P260 P260 Product Product Presh PES: R PS: R | hrough se. P: ) – Do rm wat . P27 tective air an tinse c o. Cor 314 –   | 202 – prolor to not be clothed keep autious of the Get record for the clothed keep autious of the Get record for the clothed keep autious of the Get record for the clothed keep autious of the clothed keep autions of the clothe | Do no preather oughly se only ingleyed at resplay with rinsing medica   | t t e y y t t l i l i l i l  |  |
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SDS Revision: 3.0

SDS Revision Date: 3/8/2018

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|--------------------|--|-------------------|----------------|-----|---------------------------------------|-------|--------|---------------|------|----------|------|--------|------------|
|                    |  |                   |                |     | ACC                                   | NII 1 | _      | EXPO<br>NOHSC |      | IMITS IN |      |        |            |
|                    |  |                   |                |     |                                       |       |        |               |      | <u> </u> | OSHA |        | -          |
|                    |  |                   |                |     | pp                                    | 111   | ES-    | ppm<br>ES-    | ES-  |          | ppm  |        | 4          |
| CHEMICAL NAME(S)   | CAS No.                                  | RTECS No.         | EINECS No.     | %   | TLV                                   | STEL  | TWA    | STEL          | PEAK | PEL      | STEL | IDLH   | OTHER      |
| NIOBIUM            | 7440-03-1                                | QT9900000         | 231-113-5      | 0-5 | (5.0)                                 | NA    | NF     | NF            | NF   | (5.0)    | NA   | NA     |            |
| TITANIUM DIOXIDE   | 13463-67-7                               | XR2275000         | 236-675-5      | 0-5 | (10)                                  | NA    | (10)   | NF            | NF   | (15)     | NA   | NA     | TOTAL DUST |
| THANIUM DIOXIDE    | Carc. 2; H351                            |                   |                |     |                                       |       |        |               |      |          |      |        |            |
| CALCIUM FLUORIDE   | 7789-75-5                                | EW1760000         | 232-188-7      | 0-5 | NA                                    | NA    | NF     | NF            | NF   | NA       | NA   | NA     |            |
| SALCIONIFLOORIDE   | Skin Irrit. 2; E                         | ye Irrit. 2; STOT | SE 3; H315, H3 | 19  | · · · · · · · · · · · · · · · · · · · | 20    |        |               |      |          |      |        | •          |
| SILICON            | 7440-21-3                                | VW0400000         | 231-130-8      | 0-4 | (10.0)                                | NA    | (10.0) | NF            | NF   | (10.0)   | NA   | NA     |            |
| TITANIUM           | 7440-32-6                                | XR1700000         | 231-142-3      | 0-4 | NA                                    | NA    | NF     | NF            | NF   | NA J     | NA   | NA     |            |
| BORON*             | 7440-42-8                                | ED7350000         | 231-151-2      | 0-3 | (10.0)                                | NA    | NF     | NF            | NF   | (15.0)   | NA   | NA     |            |
|                    | 7429-90-5                                | BD0330000         | 231-072-3      | 0-2 | I NA                                  | NA    | NF     | NF            | NF   | NA I     | NA   | NA     |            |
| ALUMINUM           | Water-react. 2; Flam. Sol. 1; H261, H228 |                   |                |     |                                       |       |        |               |      |          |      |        |            |
| RON OXIDE          | 1332-37-2                                | NO7380000         | 215-570-8      | 0-2 | 15                                    | NA    | NF     | NF            | NF   | 10       | NA   | NA     | FUME       |
| POTASSIUM TITANATE | 12030-97-6                               | NA                | 234-748-6      | 0-2 | NA                                    | NA    | NF     | NF            | NF   | NA       | NA   | NA     |            |
| ZIRCONIUM OXIDE    | 1314-23-4                                |                   | 215-227-2      | 0-2 | (5)                                   | NA    | (5)    | NF            | NF   | (5)      | NA   | NA     |            |
| EIROOI HOM ON BE   |  | ye Irrit. 2A; STO |                |     |                                       |       |        |               |      |          |      |        |            |
| MAGNESIUM OXIDE    | 1309-48-4                                | OM3850000         | 215-171-9      | 0-2 | (10)                                  | NA    | (10)   | NF            | NF   | (15)     | NA   | 750    |            |
| CARBON             | 7440-44-0                                | FF5250100         | 231-153-3      | 0-1 | (3.5)                                 | NA    | NF     | NF            | NF   | (3.5)    | NA   | (1750) |            |
| COPPER             | 7440-50-8                                | GL5325000         | 231-159-6      | 0-1 | (1.0)**                               | NA    | (1.0)  | NF            | NF   | (1.0)    | NA   | NA     | (0.2) FUME |

The exposure limit for welding fume has been established at 5 mg/m3 with OSHA's PEL and ACGIH's TLV. The individual complex compounds within the fume may have lower exposure limits than the general welding fume PEL/TLV. An Industrial Hygienist, the OSHA Permissible Exposure Limits For Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be consulted to determine the specific fume constituents present and their respective exposure limits.

| 1  | FIRST | AID | MEA   | SURF | : |
|----|-------|-----|-------|------|---|
| 4. | LICOL | AIL | IVICA | SURE | 3 |

| 4.1 | First Aid:                | Eyes:       | Flush eyes thoroughly with copious amounts of water for at least 15 minutes, holding eyelid(s) open to ensure complete flushing. If irritation persists, seek immediate medical attention.  |
|-----|---------------------------|-------------|---|
|     |                           | Skin:       | Remove contaminated clothing and wash affected areas with soap and water. If irritation persists, seek prompt medical attention. Do not wear contaminated clothing until after it has been properly cleaned.  |
|     |                           | Inhalation: | Remove victim to fresh air at once. If breathing is difficult, administer supplemental oxygen and seek immediate medical attention. If breathing stops, perform artificial respiration.   |
|     |                           | Ingestion:  | Ingestion is unlikely; however, particulates from grinding or cutting may be ingested. DO NOT INDUCE VOMITING. Contact ChemTrec at +1 (703) 527-3887 or the nearest Poison Control Center or local emergency telephone number for assistance and instructions. Seek immediate medical attention. If vomiting occurs spontaneously, keep victim's head lowered (forward) to reduce the risk of aspiration. |
| 4.2 | Effects of Exposure:      | Ingestion:  | Gastrointestinal irritation, nausea, and/or vomiting.   |
|     |                           | Eyes:       | Mild to moderate irritant.  |
|     |                           | Skin:       | Redness, irritation, rash at site of exposure. Chromium dust on skin can form ulcers.   |
|     |                           | Inhalation: | Inhalation of chromium and chromates, in fumes, can cause a metallic taste, tightness in the chest,   |
|     |                           |             | nausea, fever, fatigue and allergic reaction. Fumes may cause irritation to nasal membranes, bronchial  |
|     |                           |             | tubes and lungs.  |
| 4.3 | Symptoms of Overexposure: | Ingestion:  | Intestinal discomfort, nausea, vomiting, and diarrhea.  |
|     |                           | Eyes:       | Mild irritation, redness, and watering.   |
|     |                           | Skin:       | Contact dermatitis, characterized by localized red or puffy dry skin and itching.   |
|     |                           | Inhalation: | Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, metal fume fever, difficulty in breathing, frequent coughing, or chest pain.  |
| 4.4 | Acute Health Effects:     | Ingestion:  | Gastrointestinal irritation and central nervous system depression.  |
|     |                           | Eyes:       | Mild to moderate irritant.  |
|     |                           | Skin:       | Prolonged or repeated contact may cause contact dermatitis (localized redness or rash).   |
|     |                           | Inhalation: | Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, metal fume fever, difficulty in breathing, frequent coughing, or chest pain. Overexposure to metals oxide may cause metal fume fever characterized by metallic taste, tightness of  |
|     |                           | l           | chest and fever. Symptoms may last 24-48 hours following overexposure.  |



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|     |   | 4. FIRST AID MEASURES – cont'  | d  |
|-----|---|--|--|
| 4.6 | Chronic Health Effects:  Target Organs:  Medical Conditions Aggravated by Exposure: | Ingestion:  Eyes: None reported by the manufacturer.  Skin: Prolonged or repeated contact may cause contact derma Long term exposure to welding and allied processes gas irritation or pneumoconiosis or "siderosis." Inhalation o irritation of the respiratory tract, lung damage and ast manganese compounds may affect the central nervous Disease and can include slowness, changes in handwri and less commonly, tremor and behavioral changes. compounds should be seen by a physician for early determination of the respiratory function may have symptoms worsened by exposure to welding fumes; however, such reaction cannot be predicted due to the variation in the composition and in the quantity of the decomposition products. | atitis (localized redness or rash).  ses, dusts and fumes may contribute to pulmona f fume with chromium (VI) compounds can caus hma-like symptoms. Long-term overexposure system. Symptoms may be similar to Parkinsor ting, gait impairment, muscle spasms and cram Employees who are overexposed to mangane ction of neurologic problems.  HEALTH  Thammability  PHYSICAL HAZARDS  O  PROTECTIVE EQUIPMENT  E  Summars  O  PROTECTIVE EQUIPMENT  E  Best of pulmona  O  PROTECTIVE EQUIPMENT  E  Description  De |
|     |   |  | EYES SKIN LUNGS  |
|     |   | 5. FIREFIGHTING MEASURES   |  |
| 5.1 | Fire & Explosion Hazards:   | This product is not flammable.   |  |
| 5.2 | Extinguishing Methods:  | Water, CO <sub>2</sub> , Halon or Dry Chemical   |  |
| 5.3 | Firefighting Procedures:  | Fight fires as for surrounding materials. Firefighters should wear a equivalent self-contained breathing apparatus (SCBA) and protecti fought from a safe distance. Keep containers cool until well after th from fire control or dilution from entering sewers, drains, drinking waterway.  | ve clothing. Fire should be le fire is out. Prevent runoff   |
|     |   | 6. ACCIDENTAL RELEASE MEASU  | RES  |
| 6.1 | Spills:   | Spilled product may produce a slip hazard. Before cleaning any sp appropriate Personal Protective Equipment including gloves, glas respirator. Carefully vacuum or sweep up the spilled powder, particula local, state, provincial and federal regulations. Wash all affected area thoroughly before reuse.  | ill, individuals involved in spill cleanup must we<br>ses and NIOSH approved (or equivalent) du<br>ate or slag. Dispose of properly in accordance w  |
|     |   | 7. HANDLING & STORAGE INFORMA  | ATION  |
| 7.1 | Work & Hygiene Practices:   | Avoid contact to eyes, skin, and mucous membranes. Avoid inhal thoroughly after handling and use. Do not smoke, eat, drink, chew gun area. Do not store or bring tobacco products, gum, food, drinks or co the standards of good industrial hygiene practices.   | ation of vapors, gases, fumes and dusts. Wan or tobacco, or apply cosmetics within the working   |
| 7.2 | Storage & Handling:   | No unusual methods are required. Keep product contained and retain a sheltered warm area with temperature and humidity control to prever Static charge may occur during powder transfer. Keep away from it containers slowly on a stable surface. Keep container tightly closed with the container slowly on a stable surface.   | nt high humidity and "going through the dew poin<br>ncompatible materials listed in Section 10. Op   |
| 7.3 | Special Precautions:  | Read and understand the manufacturer's instructions and the pred National Standard Z-49.1, "Safety in Welding, Cutting and Allied Society, P. O. Box 351040, Miami, FL 33135 and OSHA Publication Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, Fand explosion control, exposure control and other special precautions.  | cautionary label on this product. See Americ<br>Processes," published by the American Weldi<br>2206 (29 C.F.R. 1910), U.S. Government Printi<br>PA 15250-7954 for additional details regarding f   |



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| .1  | Exposure Limits:                   |   | AC                                       | GIH                               |   | NOHSC                                |                                     |                                     | OSHA                            |                      | OTHER         |
|-----|------------------------------------|---|--|-----------------------------------|---|--------------------------------------|-------------------------------------|-------------------------------------|---------------------------------|----------------------|---------------|
|     | ppm (mg/m³)                        | CHEMICAL NAME(S)  | TLV                                      | STEL                              | ES-TWA                                    | ES-<br>STEL                          | ES-<br>PEAK                         | PEL                                 | STEL                            | IDLH                 |               |
|     |                                    | NICKEL  | (5.0)                                    | NA                                | NF  | NF                                   | NF                                  | (5.0)                               | NA                              | NA NA                |               |
|     |                                    | CHROMIUM#   | (0.5)                                    | NA                                | (0.5)                                     | NF                                   | NF                                  | (1.0)                               | NA                              | 25                   |               |
|     |                                    | IRON  | (5.0)                                    | NA                                | NF  | NF                                   | NF                                  | (10.0)                              | NA                              | NA                   | 0.5 - NIOSH   |
|     |                                    | MOLYBDENUM  | (10.0)                                   | NA                                | (10.0)                                    | NF                                   | NF                                  | (15.0)                              | NA                              | (5000)               |               |
|     |                                    | COBALT  | (0.02)                                   | NA                                | (0.05)                                    | NA                                   | NA                                  | (0.01)                              | NA                              | NA                   | DUST          |
|     |                                    | MANGANESE   | (0.2)                                    | (3)                               | (10.0)                                    | NF                                   | NF                                  | (10.0)                              | NA                              | NA                   |               |
|     |                                    | TUNGSTEN  | 5  | 10                                | 5   | 10                                   | NF                                  | 5                                   | 10                              | NA                   |               |
|     |                                    | NIOBIUM TITANIUM DIOXIDE  | (5.0)                                    | NA                                | NF<br>(40)                                | NF                                   | NF                                  | (5.0)                               | NA                              | NA                   |               |
|     |                                    | SILICON   | (10)                                     | NA<br>NA                          | (10)                                      | NF<br>NF                             | NF<br>NF                            | (15)                                | NA<br>NA                        | NA<br>NA             | TOTAL DUS     |
|     |                                    | BORON *   | (10.0)                                   | NA                                | NF  | NF                                   | NF                                  | (15.0)                              | NA<br>NA                        | NA<br>NA             |               |
|     |                                    | IRON OXIDE  | 15                                       | NA                                | NF  | NF                                   | NF                                  | 10                                  | NA                              | NA                   | FUME          |
|     |                                    | ZIRCONIUM OXIDE   | (5)                                      | NA                                | (5)                                       | NF                                   | NF                                  | (5)                                 | NA                              | NA                   | TOWE          |
|     |                                    | MAGNESIUM OXIDE   | (10)                                     | NA                                | (10)                                      | NF                                   | NF                                  | (15)                                | NA                              | 750                  |               |
|     |                                    | CARBON  | (3.5)                                    | NA                                | NF  | NF                                   | NF                                  | (3.5)                               | NA                              | (1750)               |               |
| 3.2 | Ventilation & Engineering          | COPPER  | (1.0)**                                  | NA                                | (1.0)                                     | NF                                   | NF                                  | (1.0)                               | NA                              | NA                   | (0.2) FUME    |
| 3.3 | Controls:  Respiratory Protection: | Use industrial hygiene monitoring adequate ventilation (e.g., oper equipment is available (e.g., single quantities of product and product | n doors an<br>ik, safety s<br>rovide ade | d window<br>shower, e<br>quate ve | ws, local e<br>eye-wash s<br>ntilation (e | exhaust v<br>station).<br>.g., local | entilation<br>Use in a<br>exhaust v | ). Ensur<br>chemical<br>rentilation | e approp<br>fume ho<br>, fans). | oriate de<br>ood whe | econtaminatio |
|     |                                    | these fumes and gases. Use adequate ventilation. Use NIOSH approved respiratory protection. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society. Keep the exposure within legal limits. In the worker's breathing zone and the general area, the fumes and gases must be kept below the TLVs and the equivalent exposure must compute to less than one. Keep exposure as low as possible. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the TLV. Where respiratory protection is necessary, NIOSH approved respiratory protection should be used. The selection of the appropriate respiratory protection (dust respirator, etc.) should be based on the actual or potential airborne contaminants and their concentrations present.  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .4  | Eye Protection:                    | Wear helmet or use face shield with filter lens according to ANSI Z87.1. Provide protective screens and flash goggles, if necessary, to shield others. Wear safety glasses with UV protective side shields or goggles. Wear contact lenses in combination with safety eyewear, except where the contact lenses create a likelihood of injury from intense heat, highly particulate atmosphere, or where their use is prohibited.  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .5  | Hand Protection:                   | Wear head, hand and body protection that help to prevent injury from hot metal, sparks, slag, infrared radiation, UV radiation, abrasions, contusions and heat stress. Protective clothing will not generally prevent shock except for leather if kept dry. Gloves made of leather with inside seams (or those that give equal performance) are preferred.  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .6  | Body Protection:                   | Wear head, hand and body protection that help to prevent injury from radiation, sparks and electrical shock. Wear flame resistant ear plugs to keep sparks out of ears. See ANSI Z-49.1. The clothing may include heat/fire resistant gloves, overalls, aprons, sleeves, footwear, welder's spats and head cover. Wear garments made of leather, heavyweight tightly woven wool or cotton. Keep clothing clean (free of oil, grease or solvents) and in good repair. Do not wear clothing with frayed edges, tears or holes. Do not roll up sleeves or trousers (pants should not be cuffed).   |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
|     | -                                  | 9. PHYSICAL   | . & CHI                                  | EMIC                              | AL PR                                     | OPER                                 | TIES                                |                                     |                                 |                      |               |
| .1  | Appearance:                        | Solid wire, silver-grey color   |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .2  | Odor:                              | Odorless  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .3  | Odor Threshold:                    | NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .4  | pH:                                | NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .5  | Melting Point/Freezing Point:      | NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| 6   | Initial Boiling Point/Boiling      | NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| 7   | Range:<br>Flashpoint:              |   |  |                                   | ——— <del>,</del>                          |                                      |                                     |                                     |                                 | -                    |               |
| .8  | Upper/Lower Flammability Limits:   | NA<br>NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .9  | Vapor Pressure:                    | NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .10 | Vapor Density:                     | NA  |  |                                   |   | _                                    |                                     |                                     |                                 |                      |               |
| .11 | Relative Density:                  | 7.2 – 7.8 g/cm <sup>3</sup>   |  |                                   |   |                                      |                                     |                                     |                                 | - 1                  |               |
| _   | Solubility:                        |   |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| 12  |                                    | NA NA   |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |
| .12 | Partition Coefficient (log Pow):   | NA  |  |                                   |   |                                      |                                     |                                     |                                 |                      |               |



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|      |   | 9. PHYSICAL & CHEMICAL PROPERTIES – cont'd   |
|------|---|--|
| 9.15 | Decomposition Temperature:                            | NA .   |
| 9.16 | Viscosity:  | NA   |
| 9.17 | Other Information:                                    | NA   |
| _    |   | 10. STABILITY & REACTIVITY   |
| 10.1 | Stability:  | Stable under normal conditions of use (see section 7).   |
| 10.2 | Hazardous Decomposition                               |  |
|      | Products:   | Irritating vapors and toxic gases (e.g., carbon monoxide and carbon dioxide) when burned or during   |
| 10.3 | Hazardous Polymerization: Conditions to Avoid:        | Will not occur.  |
| 10.5 | Incompatible Substances:                              | Use or storage near incompatible substances.  Strong oxidizing agents, strong acids and bases.   |
| -    | постраного сисоналосо.                                | Strong Oxidizing agents, strong acids and bases.   |
|      | -   | 11. TOXICOLOGICAL INFORMATION  |
| 11.1 | Routes of Entry:                                      | Inhalation: YES Absorption: YES Ingestion: NO  |
|      |   | section. This SDS does not provide toxicity information for welding fumes and gases that may originate from sources other than this product (for example from base metal, coatings on base metal, fluxes, and other hazardous substances present in welding area).  General Nuisance Dusts: Many of the metal oxides generated as components of welding fume, are considered nuisance dusts (such as oxides of titanium and aluminum), which are essentially nontoxic and chemically nonirritating. Skir contact has shown no problems other than possible drying and mechanical irritation. Eye contact can produce particulate irritation. Excessive inhalation can produce mild pulmonary irritation and possible non-disabling slight fibrosis of the lungs.  Chromium & Chromium Compounds: Where chromium is present in the welding consumable, Chromium III and Chromium VI (hexavalent chromium) may be generated during welding. Short term overexposure to chromium VI can cause irritation of the respiratory system, lung damage and asthma type symptoms. Workers exposed to hexavalen chromium compounds have an excess of lung cancer, and these compounds are required to be listed as carcinogens by OSHA. Absorption through the skin can cause organ system damage, primarily affecting the kidneys and liver.  (#) Chromium and its compounds are listed in the current annual report on carcinogens (prepared by the National Toxicology Program). Their presence in this alloy is not believed to present a carcinogenic or any other health hazard due to their relatively low concentration and chemical form.  Iron & Iron Compounds: Overexposure to fumes of iron may cause irritation of the respiratory tract. Long term overexposure may result in a benign condition of the lung, called "arc welders lung," or "siderosis," characterized by iron deposits in the lung, or "pigmentation," that is detectible by x-ray, but which generally does not interfere with lung function, and does not progress to permanent scarring (fibrosis) of the lung. Pigmentation of the lungs will clear in |
| 11.3 | Acute Toxicity:                                       | See Section 4.4  |
| 11.4 | Chronic Toxicity:                                     | See Section 4.5  |
| 11.5 | Suspected Carcinogen:                                 | Nickel is listed as IARC Group 2B (Possibly carcinogenic to humans); NTP13 Group 1 (Known human carcinogen) CA65 (cancer). <u>Titanium Dioxide</u> is listed as IARC Group 2B (Possibly carcinogenic to humans). <u>Chromium</u> in the form of "hexavalent chromium," is considered a human carcinogen, and thus a mutagen as well. While this product does no contain hexavalent chromium, it is well known that the chromium in this product is converted to various chemical forms during the welding process, including hexavalent chromium. Therefore, use of this product in normal welding operations must be considered to represent a cancer hazard. Other constituents of this product are not considered carcinogens o mutagens.  WARNING: This product can expose you to chemicals including Hexavalent Chromium, Nickel and Cobalt, which are known to the State of California to cause cancer or reproductive harm. For more information, go to www.P65Warnings.ca.gov.   |
| 11.6 | Reproductive Toxicity:                                | Manganese compounds may be associated with reproductive system effects.  |
|      | Mutagenicity:   | Chromium in the form of "hexavalent chromium," is believed to produce mutagenic effects in humans.   |
|      | Embryotoxicity:                                       | This product is not reported to produce embryotoxic effects in humans.   |
|      | Teratogenicity:                                       | This product is not reported to produce teratogenic effects in humans.   |
| 11.7 | Reproductive Toxicity:  Irritancy of Product:         | Manganese compounds may be associated with reproductive system effects.  |
| 11.8 | Biological Exposure Indices:                          | See Section 4.4  Consult Occupational Physician for the availability and appropriateness of biological exposure indices (e.g., blood test urine tests, etc.).  |
| 11.9 | Physician Recommendations:                            | Treat symptomatically.   |
|      |   | 42 FCOLOGICAL INFORMATION  |
|      |   | 12. ECOLOGICAL INFORMATION   |
| 10.1 | Facilities - 1-1 01-1 101                             | There are no energific data available for this and dist  |
| 12.1 | Environmental Stability: Effects on Plants & Animals: | There are no specific data available for this product.  There are no specific data available for this product.   |



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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, GHS & 1272/2008/EC Standards SDS Revision: 3.0 SDS Revision Date: 3/8/2018 13. DISPOSAL CONSIDERATIONS 13.1 Waste Disposal Dispose of in accordance with federal, state, provincial or local regulations. 13.2 Special Considerations 14. TRANSPORTATION INFORMATION The basic description (ID Number, proper shipping name, hazard class & division, packing group) is shown for each mode of transportation. Additional descriptive information may be required by 49 CFR, IATA/ICAO, IMDG and the CTDGR. 49 CFR (GND): NOT REGULATED 142 IATA (AIR): NOT REGULATED 14 3 IMDG (OCN): NOT REGULATED 14.4 TDGR (Canadian GND): **NOT REGULATED** 14.5 ADR/RID (EU): NOT REGULATED SCT (MEXICO): 14.6 **NOT REGULATED** 14.7 ADGR (AUS): NOT REGULATED 15. REGULATORY INFORMATION SARA Reporting Requirements: The following chemicals are listed on the SARA Title III (EPCRA 313 Toxic Chemical List): Chromium, Manganese, 15.1 Cobalt, Nickel SARA TPO 15.2 There are no specific Threshold Planning Quantities for the components of this product. TSCA inventory Status: 15.3 All chemical substances of this product are listed on the TSCA inventory or are otherwise exempt from inventory status. 15.4 CERCLA Reportable Quantity: Chromium: 2,270 kg (5,000 lbs); Nickel: 45.4 kg (100 lbs) Other Federal Requirements: 15.5 Manganese (and its compounds), Chromium (and its compounds), Cobalt (and its compounds) and Nickel (and its compounds) are listed as Hazardous Air Pollutants (HAPs). Manganese (and its compounds), Chromium (and its compounds), Cobalt (and its compounds) and Nickel (and its compounds) are listed as Toxic Pollutants under the Clean Water Act (CWA). Chromium, Copper and Nickel are listed as Priority Pollutants under the Clean Water Act (CWA). This product does not contain any Class 1 or Class 2 ozone depletors. 15.6 Other Canadian Regulations: This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDSL. The following chemicals are listed on the Ingredient Disclosure List: Chromium, Manganese, Nickel and Molybdenum. WHMIS Classification: D2B (Other Toxic Effects). State Regulatory Information: Chromium is found on the following state criteria lists: Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), and Washington Permissible Exposures List (WA). Titanium Dioxide is found on the following state criteria lists: MA, NJ, and PA. Niobium is found on the following state criteria lists: MA, MN, PA, and WA. Manganese is found on the following state criteria lists: FL, MA, MN, NJ, PA, and WA. Silicon is found on the following state criteria lists: MA, MN, PA, and WA. Silicon Dioxide is found on the following state criteria lists: FL, MA, MN, NJ, and PA. Zirconium Oxide is found on the following state criteria lists: MA, NJ, and PA. Tungsten is listed on the following state criteria list: FL, MA, MN, NJ, PA and WA. Magnesium Oxide is found on the following state criteria lists: FL, MA, MN, PA and WA. Nickel is listed on the following state criteria lists: fl, MA, MI, MN, NJ, PA, and WA. No other ingredients in this product, present in a concentration of 1.0% or greater, are listed on any of the following state criteria lists: California Proposition 65 (CA65), Delaware Air Quality Management List (DE), Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI).

www.P65Warnings.ca.gov.

www.P65Warnings.ca.gov.

Other Requirements:

15.8

WARNING: This product can expose you to chemicals including Hexavalent Chromium, Nickel and Cobalt, which are known to the State of California to cause cancer or reproductive harm. For more information, go to

WARNING: This product can expose you to chemicals including Hexavalent Chromium, Nickel and Cobalt, which are known to the State of California to cause cancer or reproductive harm. For more information, go to



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|      |                      | 16. OTHER INFORMATION  |
|------|----------------------|--|
| 16.1 | Other Information:   | DANGER! MAY CAUSE CANCER. MAY CAUSE DAMAGE TO ORGANS (LUNGS) THROUGH PROLONGED OR REPEATED EXPOSURE. CAUSES SERIOUS EYE IRRITATION. MAY CAUSE RESPIRATORY IRRITATION. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/furne. Wash hands and exposed skin areas with soap and warm water thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/attention. Store locked up.  NOTE: Local ventilation should be used during handling and use. Good housekeeping and personal hygiene are recommended. Some individuals may show sensitivity to exposure. Failure to observe proper practices may be hazardous to health. Use only in well-ventilated areas. Harmful by inhalation. Avoid contact with skin and eyes. Do not breathe gas, furnes, vapor or spray. Wear suitable protective clothing, gloves and eye/face protection. In case of insufficient ventilation wear suitable respiratory protective equipment. Avoid overexposure to metal furnes, powders and particulates.  WARNING: Electric shock from welding equipment or electrodes may be fatal. The welding process uses electrical circuits that sustain a welding are between the electrode and the base plate. The welding arc converts the electrical energy into a localized, concentrated heat source. The tremendously high temperatures of the arc cause the welding continuous wire and rod electrode (or filler metal, when used as such) to decompose. Electric arc working may create one or more health hazards |
| 16.2 | Terms & Definitions: | See last page of this Safety Data Sheet.   |
| 16.3 | Disclaimer:          | This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of ShipMate's & Cor-Met's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.   |
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### **DEFINITION OF TERMS**

A large number of abbreviations and acronyms appear on a SDS. Some of these that are commonly used include the following:

#### **GENERAL INFORMATION:**

| CAS No.    | Chemical Abstract Service Number                                     |
|------------|--|
| RTECS No.  | Registry of Toxic Effects of Chemical Substances Number              |
| EINECS No. | European Inventory of Existing Commercial Chemical Substances Number |

#### **EXPOSURE LIMITS IN AIR:**

| ACGIH | American Conference on Governmental Industrial Hygienists      |
|-------|--|
| IDLH  | Immediately Dangerous to Life and Health                       |
| NOHSC | National Occupational Health and Safety Commission (Australia) |
| OSHA  | U.S. Occupational Safety and Health Administration             |
| PEL   | Permissible Exposure Limit                                     |
| STEL  | Short Term Exposure Limit                                      |
| TLV   | Threshold Limit Value  |
| TWA   | Time Weighted Average  |

#### FIRST AID MEASURES:

|   | Cardiopulmonary resuscitation - method in which a person whose heart has    |
|---|---|
|   | stopped receives manual chest compressions and breathing to circulate blood |
| , | and provide oxygen to the body.   |

#### HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: HMIS

#### HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

| 0 | Minimal Hazard  |
|---|-----------------|
| 1 | Slight Hazard   |
| 2 | Moderate Hazard |
| 3 | Severe Hazard   |
| 4 | Extreme Hazard  |



#### PERSONAL PROTECTION RATINGS:

| Α |   |  |
|---|---|--|
| В |   |  |
| С |   |  |
| D |   |  |
| Е |   |  |
| F | 1 |  |

| G |           |          | 8  |          |
|---|-----------|----------|--|----------|
| Н |           |          | The state of the s |          |
| 1 |           |          | 8  |          |
| J |           |          | <b>G</b>   | 8        |
| K | 79        |          | 1  | 0        |
| X | Consult y | our supe | rvisor or irections.   | SOPs for |



#### OTHER STANDARD ABBREVIATIONS:

| Carc    | Carcinogenic                                     |  |  |  |
|---------|--|--|--|--|
| Irrit   | Irritant   |  |  |  |
| NA      | Not Available                                    |  |  |  |
| NR      | No Results                                       |  |  |  |
| ND      | Not Determined                                   |  |  |  |
| NE.     | Not Established                                  |  |  |  |
| NF      | F Not Found                                      |  |  |  |
| SCBA    | Self-Contained Breathing Apparatus               |  |  |  |
| Sens    | Sensitization                                    |  |  |  |
| STOT RE | Specific Target Organ Toxicity - Repeat Exposure |  |  |  |
| STOT SE | Specific Target Organ Toxicity - Single Exposure |  |  |  |

#### NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

| FLAMMABILITY LIMITS IN AIR: |   |  |  |  |
|-----------------------------|---|--|--|--|
| Autoignition<br>Temperature | Minimum temperature required to initiate combustion in air with no other source of ignition   |  |  |  |
| LEL                         | Lower Explosive Limit - lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source  |  |  |  |
| UEL                         | Upper Explosive Limit - highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source |  |  |  |

#### HAZARD RATINGS:

| 0       | Minimal Hazard  |                        |
|---------|-----------------|------------------------|
| 1       | Slight Hazard   | FLAMMABILITY           |
| 2       | Moderate Hazard | REACTIVITY             |
| 3       | Severe Hazard   |                        |
| 4       | Extreme Hazard  |                        |
| ACD     | Acidic          |                        |
| ALK     | Alkaline        |                        |
| COR     | Corrosive       | <b>─</b> / <b>▼ ₩ </b> |
| ₩       | Use No Water    | HEALTH                 |
| OX      | Oxidizer        | SPECIAL                |
| TREFOIL | Radioactive     | PRECAUTIONS            |

#### TOXICOLOGICAL INFORMATION:

| LD <sub>50</sub>   | Lethal Dose (solids & liquids) which kills 50% of the exposed animals |
|--|---|
| LC <sub>50</sub>   | Lethal concentration (gases) which kills 50% of the exposed animal    |
| ppm  | Concentration expressed in parts of material per million parts        |
| TD <sub>Io</sub>   | Lowest dose to cause a symptom  |
| TCLo   | Lowest concentration to cause a symptom                               |
| TD <sub>lo</sub> , LD <sub>lo</sub> , & LD <sub>o</sub> or | Lowest dose (or concentration) to cause lethal or toxic effects       |
| TC, TCo, LCio, & LCo                                       |   |
| IARC   | International Agency for Research on Cancer                           |
| NTP  | National Toxicology Program   |
| RTECS  | Registry of Toxic Effects of Chemical Substances                      |
| BCF  | Bioconcentration Factor   |
| TLm  | Median threshold limit  |
| log Kow or log Koc   | Coefficient of Oil/Water Distribution                                 |

#### **REGULATORY INFORMATION:**

| WHMIS | Canadian Workplace Hazardous Material Information System |  |  |  |  |
|-------|--|--|--|--|--|
| DOT   | U.S. Department of Transportation                        |  |  |  |  |
| TC    | Transport Canada   |  |  |  |  |
| EPA   | U.S. Environmental Protection Agency                     |  |  |  |  |
| DSL   | Canadian Domestic Substance List                         |  |  |  |  |
| NDSL  | Canadian Non-Domestic Substance List                     |  |  |  |  |
| PSL   | Canadian Priority Substances List                        |  |  |  |  |
| TSCA  | U.S. Toxic Substance Control Act                         |  |  |  |  |
| EU    | European Union (European Union Directive 67/548/EEC)     |  |  |  |  |
| WGK   | Wassergefährdungsklassen (German Water Hazard Class)     |  |  |  |  |

#### WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

| 0          | <b>(4)</b> | (1)       |          | $\bigcirc$ | <b>(4)</b> |           | R        |
|------------|------------|-----------|----------|------------|------------|-----------|----------|
| Class A    | Class B    | Class C   | Class D1 | Class D2   | Class D3   | Class E   | Class F  |
| Compressed | Flammable  | Oxidizing | Toxic    | Irritation | Infectious | Corrosive | Reactive |

### CLP/GHS (1272/2008/EC) PICTOGRAMS:

|           |           |          | $\Diamond$  |           |       | <b>①</b>              |                  | <b>(</b>    |
|-----------|-----------|----------|-------------|-----------|-------|-----------------------|------------------|-------------|
| GHS01     | GHS02     | GHS03    | GHS04       | GHS05     | GHS06 | GHS07                 | GHS08            | GHS09       |
| Explosive | Flammable | Oxidizer | Pressurized | Corrosive | Toxic | Harmful<br>Irritating | Health<br>Hazard | Environment |